

Notice of Allowability

Application No.

09/981,900

Examiner

Russell Kallis

Applicant(s)

STICKLEN ET AL.

Art Unit

1638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to appeal brief filed 11/03/2005.
2. ☒ The allowed claim(s) is/are claims 1,7-15,17,47,53-61,63-65,71-79,81-82,100,102-103 (renumbered 1-38).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 11/22/2005.
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Steve Merritt on 11/22/2005.

The application has been amended as follows:

In the claims:

Claim 1 (currently amended) A herbaceous transgenic plant which degrades lignocellulose when the transgenic plant is ground to produce a plant material comprising:

(a) the [at least one] DNA of SEQ ID NO: 4 encoding a cellulase [wherein this one DNA is comprised of DNA in sequences selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8 and SEQ ID NO: 10] which is operably linked a nucleotide sequence encoding a signal peptide [wherein the signal peptide] that directs the cellulase to a plastid or apoplast of the transgenic plant; and

(b) the [at least one] DNA of SEQ ID NO: 11 encoding a ligninase comprising a lignin peroxidase [gene, wherein this one DNA is comprised of DNA in sequences selected from the group consisting of SEQ ID NO: 11 and SEQ NO: 13] which is operably linked to a nucleotide sequence encoding a signal peptide [wherein the signal peptide] that directs the ligninase to the plastid or apoplast of the transgenic plant,

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wherein the transgenic plant degrades the lignocellulose when ground to produce the plant material.

Claim 8 (currently amended) The transgenic plant of Claim 7 wherein the leaf-specific promoter is a rubisco small subunit (*rbcS*) promoter for a *rbcS* coding sequence.

Claim 9 (currently amended) The transgenic plant of Claim 1 wherein the nucleotide sequence encoding the signal peptide [encodes] is a rubisco small subunit (*rbcS*) signal peptide coding sequence [of *rbcS*].

In Claim 10, line 1, before “9” insert --Claim-- and in line 2, delete “set forth in” and insert --of--.

Claim 47 (currently amended) A method for producing a herbaceous transgenic plant which degrades lignocellulose when the transgenic plant is ground to produce a plant material comprising:

(a) providing a first transgenic plant which includes [a] the DNA of SEQ ID NO: 4 encoding a cellulase, [wherein this one DNA is comprised of DNA in sequences wherein the DNA encoding the cellulase is selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8 and SEQ ID NO: 10] which is operably linked to a nucleotide sequence encoding a signal peptide [wherein the signal peptide] that directs the cellulose to a plastid or apoplast of the transgenic plant, and a second transgenic plant which includes [a] the DNA of SEQ ID NO: 11 encoding a ligninase comprising a lignin peroxidase [gene wherein this one DNA is comprised of DNA in sequences selected from the group consisting of SEQ ID NO: 11 and SEQ ID NO: 13] which is operably linked to a nucleotide sequence encoding a signal

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peptide [wherein the signal peptide] that directs the ligninase to the plastid or apoplast of the transgenic plant; and

(b) mating by sexual fertilization the first and the second transgenic plants to produce a third transgenic plant which includes the [first] DNA encoding the cellulase and the [second] DNA encoding the ligninase,

wherein the transgenic plant which includes the DNA encoding the cellulase and the DNA encoding the ligninase degrades the lignocellulose when ground to produce the plant material.

In Claim 53, in lines 3 and 4, delete “such as a promoter for *rbcS*”.

Claim 54 (currently amended) The method of Claim 53 wherein the leaf-specific promoter is a rubisco small subunit (*rbcS*) promoter for a *rbcS* coding sequence.

Claim 55 (currently amended) The method of Claim 47 wherein the nucleotide sequence encoding the signal peptide [encodes] is a rubisco small subunit (*rbcS*) signal peptide coding sequence [of *rbcS*].

In Claim 56, line 1, before “55” insert --Claim--.

In Claim 57, line 1, before “selected” insert --wherein the plant is--.

Claim 64 (currently amended) The method of Claim 47 wherein transformed progeny of the third transgenic plant which includes the DNA encoding the cellulase and the DNA encoding the ligninase are mated by sexual fertilization to a transgenic plant selected from the group consisting of the first, second, and third transgenic [plants] plant to produce a transgenic plant comprising [multiples] multiple copies of [genes] the DNA encoding the [cellulases] cellulase and multiple copies of the DNA encoding the ligninase [ligninases].

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Claim 65 (currently amended) A method for converting lignocellulose in a herbaceous transgenic plant material to fermentable sugars comprising:

(a) providing a herbaceous transgenic plant which includes [at least one] the DNA of SEQ ID NO: 4 encoding a cellulase, [wherein this one DNA is comprised of DNA in sequences selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8 and SEQ ID NO: 10] which is operably linked to a nucleotide sequence encoding a signal peptide [wherein the signal peptide] that directs the cellulase to a plastid or [apoplastid] apoplast of the transgenic plant and [a at least one] the DNA of SEQ ID NO: 11 encoding a ligninase comprising a lignin peroxidase [gene wherein this one DNA is comprised of DNA in sequences selected from the group consisting of SEQ ID NO: 11 and SEQ ID NO: 13] which is operably linked to a nucleotide sequence encoding a signal peptide wherein the signal peptide directs the ligninase to the plastid or [apoplastid] apoplast of the transgenic plant;

(b) growing the transgenic plant for a time sufficient for the transgenic plant to accumulate a sufficient amount of the cellulase and the ligninase in the plastid or [apoplastid] apoplast of the transgenic plant;

(c) harvesting the transgenic plant which has accumulated the cellulase and ligninase in the plastid or [apoplastid] apoplast of the transgenic plant;

(d) grinding the transgenic plant for a time sufficient to produce the herbaceous transgenic plant material wherein the cellulase and ligninase produced by the transgenic plant are released from the plastid or [apoplastid] apoplast of the transgenic plant;

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(e) incubating the herbaceous transgenic plant material for a time sufficient for the cellulase and ligninase in the plant material to produce the fermentable sugars from the lignocellulose in the herbaceous transgenic plant material; and

(f) extracting the fermentable sugars produced [from the lignocellulose] by the cellulase and the ligninase from the lignocellulose in the herbaceous transgenic plant material.

In Claim 75, line 1, before “selected” insert --wherein the plant is--.

In Claim 76, line 1, delete “first and second” and insert --cellulase and ligninase--.

Claim 82 (currently amended) The method Claim of 65 [wherein the plant material further includes] further comprising adding to (d) a plant material from a non-transgenic plant.

Claim 103 (currently amended) The method of Claim 65 further comprising;

[wherein the fermentable] (g) fermenting the sugars [are fermented] to ethanol.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Kallis whose telephone number is (571) 272-0798. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Russell Kallis Ph.D.
November 18, 2005

RUSSELL P. KALLIS, PH.D.
PATENT EXAMINER

Russell Kallis